

***CACOPSYLLA FULGURALIS* (KUWAYAMA),
AN ASIAN JUMPING PLANT LOUSE (HEMIPTERA: PSYLLIDAE),
CAUSING DAMAGE TO *ELAEAGNUS* IN BRITAIN**

C. P. MALUMPHY

Central Science Laboratory, Sand Hutton, York, YO41 1LZ.

A. J. HALSTEAD

The Royal Horticultural Society's Garden, Wisley, Woking, Surrey GU23 6QB.

Abstract. *Cacopsylla fulguralis* (Kuwayama), an Asian jumping plant louse new to Britain, is reported causing serious damage to ornamental *Elaeagnus* plants in the Channel Islands and England. The host range, biology, geographical distribution and economic importance of *C. fulguralis* are discussed. *E. commutata* is recorded as a new host.

INTRODUCTION

Cacopsylla fulguralis (Kuwayama) is a 'jumping plant louse' (also known as a 'sucker' or psyllid), native to eastern Asia, where it feeds exclusively on *Elaeagnus* spp. (Elaeagnaceae). The first European record was in France, when it was found at two plant nurseries in Brittany, in November 1999. It is now widespread in north-west and central France (Cocquempot & Germain, 2000). In March 2002, the Central Science Laboratory (CSL) received a sample of *E. x ebbingei* heavily infested with *C. fulguralis* collected in Guernsey by Terry Brokenshire of the State of Guernsey Horticulture Advisory Service. *Cacopsylla fulguralis* was first observed in Guernsey in 1999 (T. Brokenshire, pers. comm., 2002). The pest is now widespread throughout the island and particularly common in the west where it is occurring in 'plague proportions'. It is causing serious economic damage to *E. x ebbingei* hedges, which are becoming thin due to dieback.

Andrew Halstead, the Royal Horticultural Society's (RHS) senior entomologist, also received samples (which were notified to CSL) of *C. fulguralis* between March and June 2002, collected from private gardens in Leigh-on-Sea, Essex; Selsey, West Sussex and Brighton, East Sussex; and Cobham and Woking, Surrey. In each case, large infestations were damaging *E. x ebbingei* or *Elaeagnus* sp. In May, Professor Ian Hodgkinson of Liverpool John Moores University reported to the CSL that *C. fulguralis* was damaging *Elaeagnus* plants at the university. In June, *C. fulguralis* was collected on *Elaeagnus* sp. in a public car park in Chichester, West Sussex and at a commercial plant nursery in Hampshire. Rosemary Collier of the Department of Agriculture and Fisheries, Jersey also reported it as widespread in Jersey. At the beginning of July, *C. fulguralis* was found breeding on *E. x ebbingei* 'Limelight' and *E. commutata* growing in the grounds of the CSL, North Yorkshire. In England, adults have been found from March through to September.

Infested *E. x ebbingei* plants, originating in France, had previously been found at a commercial nursery in north-west England in November 2000, but *C. fulguralis* was not identified at the time due to the absence of adult specimens.

Slide-mounted specimens of *C. fulguralis* have been deposited at the Central Science Laboratory and The Natural History Museum, London.



Fig. 1. *Cacopsylla fulguralis* adult.

FIELD DESCRIPTION

There are no native species of plant jumping lice recorded feeding on *Elaeagnus* in Britain. Adult *C. fulguralis* (Fig. 1) are 2.0–2.5 mm long. They have relatively large, membranous wings and strong hind legs adapted for jumping. The body is straw coloured with brown longitudinal bands on the head and thorax. The forewings have distinct markings that vary in colour from pale to dark brown. The nymphs are cream-yellow and the later instars develop dark brown transverse markings (Fig. 2). The antennae, legs, wingpads and posterior of the abdomen are also dark brown in later instars. Each nymph is often seen with a long strand of honeydew, coated in powdery wax, extruding from the posterior of the abdomen. They eliminate copious quantities of honeydew and the upper (and occasionally lower) surfaces of the leaves become covered in sticky honeydew on which sooty moulds grow. The nymphs are usually found feeding in large groups and the adults scattered on the lower surface of the leaves. The later nymphal instars and adults can run and hop rapidly and the adults readily fly. During sunny conditions the adults accumulate in large numbers on the upper surface of the leaves and on the apical plant growth.

Useful references for the identification of this species include Kwon (1983) and Yang (1984) who describe and illustrate the adult, Miyatake (1964) illustrates the female genitalia and Park *et al.* (1980) describe and illustrate the egg and all nymphal stages.

HOST PLANTS AND BIOLOGY

There is little information published on the biology of *C. fulguralis*. In Asia, it is recorded feeding on *Elaeagnus cuprea* (Miyatake, 1972; Yang, 1984), *E. glabra* (Klimaszewski, 1973; Hodkinson, 1986; Park *et al.*, 1988), *E. macrophylla* (Baba & Miyatake, 1971; Hodkinson, 1986; Park *et al.*, 1988), *E. oldhawaii* (Cocquempot & Germain, 2000), *E. pungens* (Park *et al.*, 1988); and *Elaeagnus* spp. (Sasaki, 1954). It has also been collected from sweeping *E. thumbergii* but this has not been confirmed



Fig. 2. *Cacopsylla fulguralis* fifth nymphal instar.

as a host (Yang, 1984). In France, it has been recorded on *E. x ebbingei* (a hybrid between *E. macrophylla* and *E. pungens*) (Cocquempot & Germain, 2000). In England and the Channel Islands, it has been found breeding on *E. x ebbingei* and *Elaeagnus* spp.

Small groups of third, fourth and fifth instar nymphs of *C. fulguralis* were found on *E. commutata*, growing at the CSL during July, 2002. *Elaeagnus commutata* is recorded here as a new host for *C. fulguralis*. Adults were collected in large numbers on *E. angustifolia*, growing near heavily infested *E. x ebbingei*, at the CSL. Small numbers of eggs were laid on *E. angustifolia* in July but the nymphs failed to complete their development. According to Cocquempot & Germain (2000), *C. fulguralis* does not breed on *E. angustifolia* and *E. multiflora*.

GEOGRAPHICAL DISTRIBUTION

Cacopsylla fulguralis was described from specimens collected in Japan by Kuwayama (1908—*Psylla*). It has also been recorded in Korea, the Philippines and Taiwan (Kuwayama, 1908; Sasaki, 1954; Baba & Miyatake, 1971; Miyatake, 1972; Klimaszewski, 1973; Park *et al.*, 1980; Kwon, 1983; Hodkinson, 1986). A slide mounted specimen deposited at the Natural History Museum, London was collected on *Elaeagnus* in China (J. Martin, pers. comm., 2002). It has recently been recorded in France (Cocquempot & Germain, 2000), the Channel Islands and England.

ECONOMIC IMPORTANCE

Elaeagnus plants are widely grown in Britain, principally for their lustrous foliage. They are tolerant of poor soils and have a high salt tolerance, so they are popular

in coastal gardens and are often used to create shelter belts in exposed areas. Large infestations of *C. fulguralis* can seriously damage *Elaeagnus* plants. The feeding activity of colonies, especially the nymphal instars, distorts new growth, causes chlorosis and necrosis of the foliage, premature leaf drop and desiccation of stems. Host vigour is reduced by sap removal and the loss of photosynthetic area as infested plants are smothered with eliminated honeydew, which serves as a substrate for the growth of a black sooty mould. Infested ornamental plants lose their aesthetic appearance and therefore their quality and value.

Elaeagnus x ebbingei is widely used for hedging in the Channel Islands but appears to be particularly susceptible to *C. fulguralis*. The psyllids have caused dieback resulting in gaps in hedges in Guernsey. *Cacopsylla fulguralis* is not a known vector of plant pathogens.

REMARKS

Cacopsylla fulguralis is likely to spread and naturalise in much of England and Wales, being limited only by the distribution of its *Elaeagnus* hosts. The adults are active and capable of flight and therefore have a high natural dispersal potential. It is also likely to be moved over long distances in trade and has been found at commercial plant nurseries in England and France. Several exotic psyllids have already been introduced in Britain, for example, *Acizzia uncatoides* (Ferris & Klyver) on *Acacia* spp., *Calophya rhois* (L w) on *Cotinus coggygria*, *Ctenarytaina eucalypti* (Maskell) on *Eucalyptus* spp., *Homotoma ficus* (L.) on *Ficus carica*, *Livilla variegata* (L w) on *Laburnum* sp., *Psylla alaterni* F rster on *Rhamnus alaternus*, *Psylla pulchella* L w on *Cercis siliquastrum*, *Trioza alacris* Flor on *Laurus nobilis* and *Trioza vitreoradiata* (Maskell) on *Pittosporum* spp. (Hollis, 1978; Hodkinson & White, 1979; Halstead, 1992; Martin & Malumphy, 1995). There are several other Asian psyllid species, which feed on *Elaeagnus* spp. that have the potential to become pests in Europe if accidentally introduced.

Suspected outbreaks, or interceptions, of non-indigenous psyllids on growing plants should be reported to the local DEFRA Plant Health and Seeds Inspectorate office or the PHSI HQ, York (Tel.: 01904 455174, Fax: 01904 455197) and samples submitted to the CSL for identification.

ACKNOWLEDGEMENTS

Dr Jon Martin of the Natural History Museum confirmed the identification of the psyllid. Terry Brokenshire of the State of Guernsey Horticulture Advisory Service provided much useful information regarding the psyllid in Guernsey. Professor Ian Hodkinson of Liverpool John Moores University provided copies of most of the references. Susyn Andrews of the Royal Botanic Gardens, Kew, identified the plant *Elaeagnus commutata*.

REFERENCES

- Baba, K. & Miyatake, Y., 1971. Notes on Psyllidae from Sado Island, Niigata Prefecture (Hemiptera: Homoptera). *Bulletin of the Osaka Museum of Natural History* **24**: 5–13.
- Cocquempot, C. & Germain, J.-F., 2000. Un nouveau ravageur de l'*Elaeagnus x ebbingei* en France: *Cacopsylla fulguralis*. *Revue Horticultural, Paris* **416**: 32–34.
- Halstead, A. J., 1992. A psyllid pest of acacia new to Britain. *British Journal of Entomology and Natural History* **5**: 95–96.

- Hodkinson, I., 1986. The psyllids (Homoptera: Psylloidea) of the Oriental Zoogeographical Region: an annotated check-list. *Journal of Natural History* **20**: 299–357.
- Hodkinson, I. D. & White, I. M., 1979. Homoptera Psylloidea. *Handbook for the Identification of British Insects* Vol. II Part 5(a). Royal Entomological Society of London. 98 pp.
- Hollis, D., 1978. *Floria variegata* Löw (Homoptera: Psylloidea). *Britain. Entomologists' Gazette* **31**: 171–172.
- Klimaszewski, S. M., 1973. The jumping plant lice or psyllids (Homoptera, Psylloidea) of the Palaearctic. An annotated Check-list. *Annals Zool., warsz.* **30**: 1–132.
- Kwon, Y.J., 1983. Psylloidea of Korea (Homoptera: Sternorrhyncha). *Insecta Koreana*.
- Kuwayama, S., 1908. Die Psylliden Japans I. Trans. *Sapporo Nat. Hist. Soc.* **2**: 149–190.
- Martin, J. H. & Malumphy, C. P., 1995. *Trioza vitreoradiata*, a New Zealand jumping plant louse (Homoptera: Psylloidea), causing damage to *Pittosporum* spp. *Britain. Bulletin of Entomological Research* **85**: 253–258.
- Miyatake, Y., 1964. A revision of the subfamily Psyllinae from Japan. II (Hemiptera: Psyllidae). *J. Fac. Agric. Kyushu Univ.* **13**: 1–37.
- Miyatake, Y., 1972. Studies on the Philippine Psyllidae (Hemiptera: Homoptera) II. *Bulletin of the Osaka Museum of Natural History* **26**: 11–34.
- Park, H. C., Park, S. O. & Lee, C. E., 1980. The immature stages of *Psylla fulguralis* Kuwayama (Homoptera: Psyllidae). *Nature and Life* **10**: 1–7 (Korea).
- Park, H. C., Lee, C. E. & Kim, H. S., 1988. Wing morphometric analysis of *Psylla elaeagni* complex (Homoptera: Psyllidae). *The Korean Journal of Systematic Zoology Special Issue* **2**: 243–250.
- Sasaki, K., 1954. A list of the known species and their host-plants of the Psyllidae of Japan (Homoptera). *Scient. Rep. Matsuyama agric. Coll.* **14**: 23–39.
- Yang, C. T., 1984. *Psyllidae of Taiwan*. Taiwan Museum Special Publication Series. Number 3. China.

CD-ROM REVIEW

Interactive catalogue of World Chalcidoidea 2001. By J.S. Noyes. (Vancouver; Taxapad, 2001). CD-ROM, 351 photographs. US\$190.00

This is an updated version of the *Catalogue of the Chalcidoidea of the World*, Noyes (1998), with records up to mid-2000. The catalogue covers 21,848 species in 2033 genera including all species recorded from the British Isles. Although not the easiest software to use, the database contains species descriptions, close-up photographs and a wealth of useful information on chalcidoid biology. For example, by choosing Chalcidoidea, Statistics and Agromyzidae one can prepare a list of parasitoids attacking this group of flies. Further clicks on Statistics will yield a range of searchable fields and a list of species attacking British agromyzids can be assembled for further interrogation.

JOHN BADMIN